

REMARKS

Claims 1-18 are pending the above-identified application.

In the Office Action of September 23, 2003, claims 1, 2, 4-9, 12 and 13 were allowed. Claims 3, 10, 11 and 14-18 were rejected. The specification was objected.

In response, claim 3 has been canceled. Claim 10 and the specification have been amended.

A. Objection to the Specification:

The specification on page 26 has been amended to reflect "Figure 1" instead of "Figure 1A" per the Examiner's recommendation. Accordingly, Applicant respectfully requests withdrawal of these objections.

B. § 112, first paragraph Rejection:

Claims 3, 10 and 11 were rejected under 35 U.S.C. § 112, first paragraph, because the specification allegedly did not reasonably enable person skilled in the art to which it pertains. In response to this rejection, claim 3 has been canceled and claim 10 has been amended to depend on claim 4 instead of claim 3. Applicant respectfully requests withdrawal of this rejection.

C. § 103(a) Rejections:

Claims 3, 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2000-21380 in view of JP 10-284035. Claims 14-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Taki et al (U.S. Patent NO.: 5,418,082) in view of JP 10-284035. Applicant respectfully traverses these rejections.

Again, claim 3 has been canceled and claim 10 has been amended to depend off claim 4. Thus, this rejection is moot. Applicant respectfully requests withdrawal of this rejection.

Regarding claims 14-18, all rights and title to the present application and Taki et al, were, at the time the invention was made, owned by Sony Corporation or subject to an obligation to assignment to Sony Corporation.

Accordingly, Taki et al is disqualified from being used in a rejection under 35 U.S.C. § 103(a) against the claims of the present Application.

The present invention relates to a secondary battery where a non-aqueous electrolyte solution is injected into the outer packaging. The electrode is stored at the end of the outer packaging can. The free ends of the electrodes are sealed by means of a safety valve caulked on one end of the outer packaging through a gasket. At the center of the safety valve, there is a projecting portion that is welded into the electrode lead of the electrodes. The safety valve also has a disk in the center and a sub-disk. When the projecting portion and the sub-disk are separated from each other, a current cut-off operation can be reliably performed. When the pressure in the outer packaging can is higher than the pressure in the current cut-off state, the safety valve itself is cleaved so that the generated gas is release through a ventilation hole formed in the lid of the disk.

In conventional non-aqueous battery, such as the one in JP'035, although a portion of the safety valve is cleaved, the centering portions are only half cleaved and the widths of the cleavage are small. Figure (b) of JP'035 consists a letter "C" configuration which does not allow the centering portion of the safety valve to be cleaved. In other words, simply having a circular portion, as in JP'035, will not allow for the cleave operation to perform smoothly. This causes the passage area for the generated gas to be only an area corresponding to the difference between the different portions along the safety valve. Thus, when a gas is generated in the outer packaging can, the conventionally used safety valve cannot release the generated gas within a short time and the current cut-off state cannot be performed reliably.

By using a plurality of peripheral holes located along a circle centering on a symmetrical point of the central hole, the cleave operation can be performed smoothly. The passage area allowing for generating gas to pass in the present invention is much larger than the conventional used safety valve. Thus, when gas is generated in the outer packaging can, it can be released much faster. As a result, a current cut-off operation can be reliably performed in a current cut-off state and gas can be discharged within a shorter time in a cleavage state.

None of the references discloses or suggests a safety valve having two different dimension circles which a plurality of linear thin portions are formed to allow a current cut-off operation to be performed reliably in a current cut-off state, and a gas can be discharged within a short period of time in a cleavage state.

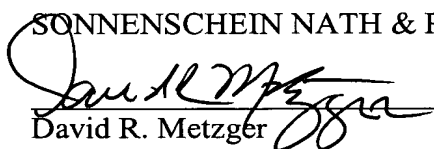
Accordingly, it would not have been obvious to one skilled in the art at the time when the invention was made to combine the references as suggested by the Examiner to derive what is recited in claims 10 and 11 or claims 14-18.

Claims 15-18 depend directly or indirectly from claim 14 and are therefore allowable for at least the same reasons that claim 14 is allowable. Applicant respectfully submits that this rejection has been overcome and requests that it be withdrawn.

In view of the foregoing, it is submitted that pending claims are patentable over the reference cited by the Examiner. Further, all of the Examiner's objections and rejections have been addressed herein. It is, therefore, submitted that the application is in condition for allowance. Notice to that effect is respectfully requested.

Respectfully submitted,

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